ATTACHMENT F

CLOSURE PLAN FOR THE TECHNICAL AREA 16 OPEN BURNING UNITS

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LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
ASTM	American Society for Testing and Materials
COPC	contaminants of potential concern
DOE/NNSA	U.S. Department of Energy, National Nuclear Security Administration
EPA	U.S. Environmental Protection Agency
HE	high explosives
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
lb(s)	pound(s)
NMED	New Mexico Environment Department
OB	open burning
PPE	personal protection equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RRES-SWRC	Risk Reduction and Environmental Stewardship Division Solid Waste Regulatory Compliance Group
SAP	sampling and analysis plan
SW-846	EPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"
TA	technical area

ATTACHMENT F
CLOSURE PLAN FOR THE TECHNICAL AREA 16 OPEN BURNING UNITS

This closure plan describes the activities necessary to close the hazardous waste open burning (OB) units at Los Alamos National Laboratory (LANL) Technical Area (TA) 16. The information provided in this closure plan addresses the applicable closure requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) § 270.14(b)(13), and 20.4.1 NMAC, Subpart V, Part 264, Subparts G and X, revised June 14, 2000 [6-14-00].

Closure of each OB unit will include treatment or removal of any remaining untreated hazardous waste and management of hazardous waste residues and contaminated system components in accordance with the closure performance standards. Verification that closure performance standards have been met will be provided to the New Mexico Environment Department (NMED). In the event that the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart G cannot be achieved, this closure plan may be modified to request alternative closure requirements, as allowed by 20.4.1 NMAC § 264.110(c). Closure activities will minimize the need for further maintenance, preclude the release of hazardous waste or hazardous constituents to environmental media, and be protective of human health.

This closure plan will be used to provide guidance and permit conditions for the partial closure of the OB units at TA-16. Closure of the TA-16 OB units will likely occur separately and over the active life of the TA-16 facility. Because there is a high potential that decontamination procedures, analytical verification procedures, and the environmental characterization of TA-16 will change and improve over the active life of the facility, this closure plan describes the general closure activities for the OB units at TA-16 and establishes the procedure of submitting a separate detailed TA-16 OB unit-specific sampling and analysis plan (SAP) to the NMED for approval 90 days prior to the time of closure for each OB unit. The SAP will provide the required level of detail to assure that closure performance standards are met, consistent with the appropriate decontamination and verification requirements existing at the time of closure.

This attachment is organized as follows:

- General closure information (Section F.1)
- Descriptions of the TA-16 OB units (Section F.2)
- Closure procedures for the TA-16 OB units (Section F.3)
- Sampling and analysis plan (Section F.4).

Until closure is complete and has been certified in accordance with 20.4.1 NMAC § 264.115 [6-14-00], as discussed in Section F.1.6, a copy of the approved closure plan and any approved revisions will be on file at LANL's Risk Reduction and Environmental Stewardship Division Solid Waste Regulatory Compliance Group (RRES-SWRC) and at the U.S. Department of Energy, National Nuclear Security Administration (DOE/NNSA) Los Alamos Site Office (LASO).

F.1 GENERAL CLOSURE INFORMATION

This section is prepared in accordance with the requirements of 20.4.1 NMAC § 270.14(b)(13), and 20.4.1 NMAC, Subpart V, Part 264, Subparts G and H [6-14-00], as applicable.

F.1.1 Closure Performance Standard [20.4.1 NMAC § 264.111]

The TA-16 OB units will be closed to meet the following performance standards:

- Minimize the need for further maintenance
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or atmosphere
- Comply with the applicable closure and post-closure requirements of 20.4.1 NMAC, Subpart V, Subparts G and X [6-14-00].

F.1.2 Partial and Final Closure Activities [20.4.1 NMAC § 264.112(d)]

Partial Resource Conservation and Recovery Act (RCRA) closure is the closure of a hazardous waste management unit at a facility that contains other active hazardous waste management units. Partial closure at TA-16 will consist of closing one or more of the TA-16 OB units, while leaving the other units at LANL in operation. Partial closure (hereinafter simply referred to as closure) will be deemed complete when the closure performance standards have been met and verified; the closure certification has been submitted to the NMED; and the NMED has approved the closure.

Final RCRA closure of the LANL hazardous waste management facility will occur when all of LANL's hazardous/mixed waste management units are closed. Final closure will consist of assembling documentation on the closure status of each waste management unit, including all previous closures as well as land-based units where closures have been or are being addressed via alternative closure requirements. Final closure will be deemed complete when the closure certification has been submitted to the NMED, and the NMED has approved the final closure.

F.1.3 General Closure Schedule [20.4.1 NMAC §§ 264.112(b)(6), 264.112(e), and 264.113]
Closure of the TA-16 facility is anticipated to occur in the year 2100; however, closure of a TA-16 OB unit may occur at any time before then. Written notification will be provided to the NMED before the start of closure activities for each TA-16 OB unit. Removing hazardous wastes and decontaminating or dismantling equipment in accordance with an approved closure plan may be conducted at any time before or after notification of closure, pursuant to 20.4.1 NMAC § 264.112(e) [6-14-00]. Closure activities will begin according to the requirements of 20.4.1 NMAC § 264.112(d)(2) [6-14-00]. Treatment, removal, or disposal of hazardous wastes will begin in accordance with the approved closure plan, as required by 20.4.1 NMAC § 264.113(a) [6-14-00]. In the event that closure activities cannot begin at a unit within 90 days, LANL will notify the Secretary of the NMED in accordance with the extension requirements in 20.4.1 NMAC § 264.113(a) [6-14-00]. Closure activities will be completed in accordance with the requirements of 20.4.1 NMAC § 264.113(a) [6-14-00]. Closure will be conducted in accordance with the general schedule presented in Table F-1. Further details regarding the schedule of closure activities on an OB unit-specific basis will be included with the OB unit-specific closure SAP discussed in Section F.4 of this plan. In the event that closure of an OB unit is prevented from proceeding according to schedule, LANL will notify the Secretary of the NMED in accordance with extension request requirements in 20.4.1 NMAC § 264.113(b) [6-14-00]. In addition, the demonstrations in 20.4.1 NMAC §§ 264.113(a)(1) and (b)(1) will be made in accordance with 20.4.1 NMAC § 264.113(c) [6-14-00].

F.1.4 Amendment of the Closure Plan [20.4.1 NMAC § 264.112(c)]
In accordance with 20.4.1 NMAC § 264.112(c) [6-14-00], LANL will submit a written notification of or request for a permit modification to authorize a change in the approved closure plan whenever:

- There are changes in operating plans or facility design that affect the closure plan
- There is a change in the expected year of closure

- Unexpected events occur during closure that require modification of the approved closure plan
- The owner or operator requests the Secretary of the NMED to apply alternative requirements to a regulated unit under 20.4.1 NMAC § 264.110(c).

The written notification or request will include a copy of the amended closure plan for approval by the NMED.

LANL will submit a written request for a permit modification with a copy of the amended closure plan at least 60 days prior to the proposed change in unit design or operation or no later than 60 days after an occurrence of an unexpected event that affects the closure plan. If the unexpected event occurs during closure, the permit modification will be requested within 30 days of the occurrence. The Secretary of the NMED may request a modification of the closure plan under the conditions presented in the bulleted items above. LANL will submit the modified plan in accordance with the request within 60 days of notification, or within 30 days of notification if a change in facility condition occurs during the closure process.

F.1.5 Closure Cost Estimate, Financial Assurance, and Liability Requirements [20.4.1 NMAC § 264.140(c)]

In accordance with 20.4.1 NMAC § 264.140(c) [6-14-00], LANL, as a federal facility, is exempt from the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart H [6-14-00], to provide a cost estimate, financial assurance mechanisms, and liability insurance for closure actions.

F.1.6 Closure Certification [20.4.1 NMAC § 264.115]

Within 60 days after completion of closure activities at each OB unit at TA-16 or final closure of the LANL facility, LANL will submit to the Secretary of the NMED, via certified mail, a certification that the unit or facility has been closed in accordance with the approved closure plan. The certification will be signed by the appropriate DOE/NNSA and LANL officials and by an independent, registered professional engineer, in accordance with 20.4.1 NMAC § 264.115 [6-14-00]. Documentation supporting the independent, registered engineer's certification will be furnished to the Secretary of the NMED, as specified in 20.4.1 NMAC § 264.115 [6-14-00]. A copy of the certification and supporting documentation will be maintained by both DOE/NNSA LASO and RRES-SWRC.

F.1.7 Security

Because of the ongoing nature of waste management operations at TA-16, security and administrative controls for the TA-16 OB units will be maintained by the DOE/NNSA or another authorized federal agency for as long as necessary to prohibit public access. Security and/or administrative fences in the vicinity of the OB units will be maintained to ensure that public access into the vicinity of the OB units is prevented.

F.1.8 Closure Reports

Upon completion of RCRA closure activities at a TA-16 OB unit, a closure report will be prepared and provided to the Secretary of the NMED. The report will document the closure and contain, for example, the following:

- The certification described in Section F.1.6
- A general summary of closure activities
- Any significant variance from the approved closure plan and the reason for the variance
- A summary of any sampling data associated with the closure
- The location of the file of supporting documentation (e.g., memos, logbooks, laboratory sample analysis data)
- Storage or disposal location of hazardous waste resulting from closure activities
- A certification of accuracy of the report.

F.1.9 Survey Plat and Post-Closure Requirements [20.4.1 NMAC §§ 264.116 and 264.117 through 264.120]

For closure, LANL intends to treat or remove hazardous waste from the TA-16 OB unit undergoing closure, and properly manage hazardous waste residues and contaminated structures and equipment associated with the unit. If decontamination to the cleanup levels approved in the OB unit-specific closure SAP cannot be achieved, LANL intends to dispose of or otherwise manage the contaminated structures, equipment, soil, or other media. If decontamination to these cleanup levels is not achievable, LANL may propose an alternate demonstration of decontamination, as circumstances indicate. A survey plat, post-closure certification, and post-closure notices will be submitted to the NMED, in accordance with 20.4.1 NMAC §§ 264.116, 264.119, and 264.120, if necessary.

If a TA-16 OB unit cannot be closed as described above, LANL will conduct post-closure or equivalent activities in accordance with Appendix G of the most recent version of the "Los Alamos National Laboratory General Part B Permit Application," hereinafter referred to as the General Part B. A survey plat prepared in accordance with 20.4.1 NMAC § 264.116 [6-14-00] will be filed with the appropriate authorities at certification of closure, as described in that regulation. A survey plat indicating the location and dimensions of the OB unit with respect to permanently surveyed benchmarks will be submitted to the local zoning authority (i.e., Los Alamos County) and to the NMED at the time of submission of the certification of closure. The plat filed with the local zoning authority will contain a prominently displayed note, which states the obligation of LANL and DOE/NNSA to restrict disturbance of the unit in accordance with the applicable regulations in 20.4.1 NMAC, Subpart V, Part 264, Subpart G. Post-closure notices will be filed with the appropriate authorities, as described in 20.4.1 NMAC § 264.119 [6-14-00]. To meet that requirement, DOE/NNSA will file a "Land Use Restriction Notice" or equivalent document with the County of Los Alamos and other authorized agencies. Within 60 days after completion of the established post-closure care period for the unit, LANL will submit to the Secretary of the NMED, via certified mail, a certification of completion of post-closure care in accordance with the requirements of 20.4.1 NMAC § 264.120 [6-14-00].

F.2 DESCRIPTIONS OF THE TA-16 OB UNITS

This section provides a general description of TA-16 and the TA-16 OB units. LANL does not currently intend to reduce the areal extent or the design capacities of the OB units at TA-16 during the active life of those units. Estimated annual quantities for the OB units at TA-16 are provided in the most recent version of the "Los Alamos National Laboratory General Part A Permit Application," hereinafter referred to as the General Part A.

TA-16 is located in the southwestern portion of LANL. It is situated on a broad mesa that is bound on the north by Cañon de Valle, on the south by State Road 4 and Bandelier National Monument, and on the west by West Jemez Road (State Road 501) and the Santa Fe National Forest. Elevation ranges from approximately 7,700 feet at the west end of the TA to approximately 6,800 feet at the east end. Topography is varied, ranging from steep precipitous canyon walls to sloping mesa tops.

The OB units located at TA-16 are:

- The TA-16-388 Flash Pad, and

- The TA-16-399 HE Burn Tray.

F.2.1 Estimate of Maximum Waste Treated

The maximum total capacity of hazardous waste that may be flashed at the TA-16-388 Flash Pad at any time is 40,000 pounds (lb) per burn; this capacity consists mainly of non-combustible materials. The maximum total capacity of liquid hazardous waste that may be treated at the TA-16-388 Flash Pad is 100 gallons per burn, and the maximum total capacity of wet HE that may be treated is 1,000 lb per burn. The maximum total capacity of hazardous waste that may be treated at the TA-16-399 HE Burn Tray is1,000 lb.

The estimates of the total maximum inventory of hazardous wastes treated over the active life (1980 to present) of each OB unit are:

- TA-16-388 Flash Pad = 273,334 lbs of solids and 666 gallons of liquids
- TA-16-399 HE Burn Tray = 155,315 lbs

F.2.2 Description of Treated Wastes

The TA-16 OB units are used to treat a variety of high explosives (HE)-contaminated wastes including, but not limited to, scrap HE, HE-contaminated equipment and debris, combustible solids, HE wastewater treatment residues (e.g., wet HE and filters), and HE-contaminated liquids. The hazardous wastes treated at the TA-16 OB units are generated at LANL primarily from HE processing (e.g., machining and pressing), research and development activities, decontamination and decommissioning, and environmental restoration activities. Information on the hazardous component(s) of the wastes treated at the TA-16 OB units is provided in the General Part A. Additional information is available in the Waste Analysis Plan in Appendix B of the General Part B.

F.3 CLOSURE PROCEDURES FOR THE TA-16 OB UNITS

Closure activities at the TA-16 OB units will involve the treatment or removal of untreated hazardous wastes, proper management of hazardous waste residues and contaminated structures and equipment associated with the OB units and subsequent appropriate disposition, and verification that the closure performance standards have been achieved.

F.3.1 Removal of Hazardous Waste

After hazardous wastes are treated at each OB unit, non-combustible debris and ash are removed promptly, characterized, and disposed of properly. Therefore, removal of hazardous waste prior to

the initiation of closure activities is not anticipated. Appropriate shipping papers will accompany the treated debris and ash during transport to a waste management facility.

F.3.2 Closure Procedure and Decontamination

Closure activities may include the removal, treatment, segregation, and/or disposition of structures, associated equipment, concrete pads, and/or soil. After removal, materials will be evaluated to determine the need for treatment by OB at TA-16 and/or characterization prior to recycling, further treatment, or disposal. Decontamination procedures, if conducted as part of closure activities, will be verified by sampling and analysis. Decontamination conducted during closure activities will be done as discussed generally in Section F.3.4 and as prescribed in the OB unit-specific SAP (see Section F.4). Sampling and analysis will be done in accordance with appropriate quality assurance/quality control (QA/QC) procedures as required by the individual analytical technique or the authority for the relevant standard methods (e.g., U.S. Environmental Protection Agency [EPA] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," [*SW-846*], EPA, 1986; American Society for Testing and Materials [ASTM]). Information from the operating record for the OB unit to be closed will be reviewed before proceeding with closure activities. Closure will be conducted in accordance with the general schedule presented in Table F-1, as amended by the TA-16 OB unit-specific SAPs submitted 90 days prior to the actual closures.

F.3.3 Preliminary Closure Activities

F.3.3.1 Safety Precautions

Job hazards associated with closure activities will be identified, controls developed, and workers briefed before closure activities are conducted, in accordance with LANL safety procedures. Before proceeding with closure activities, the OB unit to be closed will receive a thorough visual inspection for unburned materials. Personnel involved in closure activities will wear appropriate personal protective equipment (PPE), specified by the Industrial Hygiene and Safety Group, and will follow good hygiene practices to protect themselves from exposure to hazardous waste. The level of PPE that will be required will depend upon the physical hazards present and the levels of chemical contamination that are detected, if any. Workers involved in closure activities will be required to have appropriate training (see Attachment D in this document and Appendix D in the General Part B). Contaminated PPE will either be decontaminated or managed in compliance with appropriate waste management regulations.

F.3.3.2 Background Determination

Before any decontamination activity begins, background levels for potential hazardous waste constituents will be determined. Decontamination and verification sampling procedures may involve wash water sampling, swipe sampling for HE, soil sampling, or other methods available at the time of closure. If wash water methods are used to decontaminate structures and equipment at the TA-16 OB units, background samples will be obtained from clean water, cleaning equipment, and detergent solutions, if used. Background soil concentration values derived from LANL studies developed under the LANL corrective action or other programs will be used to determine the hazardous constituent background/baseline levels. Details of appropriate background levels and or necessary samples and collection techniques will be included in the TA-16 OB unit-specific SAPs, as discussed in Section F.4 of this closure plan.

F.3.3.3 Structural Assessment

After removal of equipment, the concrete base (if present) of the OB unit will be inspected for any cracks or conditions that could potentially lead to loss of wash water or steam condensate containment if wash water or steam cleaning procedures are used for decontamination. If a crack or gap is present, either a swipe sample or a representative sample of the media (e.g., concrete) will be collected to determine the presence of contamination or the concrete base will be removed and managed appropriately.

If a sample is collected, it will be analyzed for hazardous contaminants of potential concern (COPC) determined through a review of the chemical properties of the waste treated during the operating history of the OB unit and through an evaluation of the history of any spills that may have occurred at the OB unit. If contamination is detected, the surface flaw will be decontaminated prior to repairing the crack or gap.

F.3.4 Decontamination of the TA-16 OB Units

F.3.4.1 Decontamination of Structures, Associated Equipment, Concrete Pads, and Soil

Structures, associated equipment, concrete pads, and soil will be decontaminated, if necessary, and/or removed during closure activities at the TA-16 OB units. The anticipated decontamination procedures are discussed generally in this closure plan, as specific details will be included in the OB unit-specific SAPs to be submitted to the NMED for approval (see Section F.4 of this closure plan). Before proceeding with closure activities, the OB unit to be closed will receive a thorough visual inspection for unburned materials and the OB unit's operating record will be evaluated to determine appropriate COPCs.

OB unit structures and associated equipment are essentially comprised of steel trays and plates, firebrick, sand, burners, mounts, steel pallets, and thermocouples. Most of the structures and equipment will be decontaminated by treatment (i.e., flashing or burning) to remove any HE residuals. Other potential closure activities for the concrete pads, walls, and liners (where present) include decontamination or removal. If the decision is made to decontaminate the concrete pads and/or walls, they will be washed down with decontamination solutions using mops and/or sponges or steam cleaned to minimize the amount of liquid waste generated as a result of decontamination activities. If any portion of an OB unit cannot or will not be decontaminated to acceptable levels, the contaminated portion will be disposed of in accordance with appropriate waste management regulations. Concrete pads and other equipment that are successfully decontaminated may be reused if a potential use is identified.

For structures and associated equipment that will be decontaminated by washing, a portable berm or other device (e.g., plastic sheeting, wading pools, or existing secondary containment) designed to collect and provide containment for used wash water will be used, as necessary. The used wash water will be collected and transferred to appropriate containers, where it will be sampled and analyzed for the COPCs determined during the documentation review. The containers of used wash water will be stored appropriately, pending analysis for decontamination verification. If structures or equipment are steam cleaned at TA-16-400, sumps will be used to contain the steam condensate. Subsequent disposition options for the decontaminated structures and equipment include reuse, recycling, or disposal.

Decontamination of OB unit concrete pads and/or walls will involve removing any contamination through washing the surface with appropriate decontamination solutions, steam cleaning, or physically removing material until decontamination is achieved. Washes will be done with mops and/or sponges or steam cleaning to minimize the amount of liquid waste generated as a result of decontamination activities. A portable berm or other device (e.g., absorbent socks, plastic sheeting, wading pools, or existing secondary containment) designed to collect and provide containment for used wash water or steam condensate will be used, as necessary. After the decontamination process, the used wash water and/or steam condensate will be collected, sampled for analysis, and stored in appropriate containers at the site. Each concrete structure may undergo several wash cycles; however, the option to remove the concrete and manage it as hazardous waste may be exercised at any time.

If the decision is made to not decontaminate the concrete or to remove only the contaminated portions (e.g., by scraping or cold-milling), it will be totally or partially removed and disposed of appropriately in lieu of decontamination activities. The concrete may be transported to and stored at other hazardous waste management locations to facilitate the closure process. If the concrete is totally removed, soil samples will be collected from the area underlying the original concrete. Soil sampling procedures are described generally in Section F.3.4.2. If removal of the contaminated portion of the concrete is successful, the underlying soil will be presumed to be uncontaminated and soil sampling will not be required.

Complete or partial removal of the concrete may be performed until one of the decontamination verification criteria are met. If partial removal is successful in eliminating contamination, it will be assumed that the remaining material, including underlying soil, is clean.

The polypropylene liner associated with the concrete pad at the TA-16-388 Flash Pad will be removed and managed appropriately.

F.3.4.2 Soil Sampling

Closures at the TA-16 OB units may require soil removal to meet one of the decontamination verification criteria. Examples include the detection of contamination that may have migrated beyond a TA-16 OB unit to the surrounding soil, and cases in which operating records indicate that a release of hazardous waste from an OB unit to the surrounding soil has occurred.

If collection of soil samples is determined to be necessary to demonstrate decontamination, background soil concentration values will be established as described in Section F.3.3.2 to provide a baseline for decontamination verification. Sampling locations to determine the extent of contamination will be based upon a biased random sampling approach, including historical evidence of releases, physical evidence of distressed vegetation or visual staining, and any other information that indicates potential contamination. The number of samples, locations, depths, and sampling methods will be determined before closure and included in the TA-16 OB unit-specific closure SAP, as discussed in Section F.4. Results from sampling will be compared to the background samples and/or baseline concentration levels included in the closure SAP. If analysis shows that the soil at the OB unit(s) is contaminated, soil sampling results that are above the background/baseline levels will be used to identify the extent of soil contamination. Soils with levels

of contamination that exceed the decontamination criteria will be removed in layers and sampling will be conducted following removal of each layer. This procedure will be used to minimize the amount of waste generated. The removal and sampling process will be repeated until one of the decontamination criteria is achieved or it is decided to close the OB unit in place, pursuant to 20.4.1 NMAC § 264.603. OB units (i.e., miscellaneous units) that cannot meet the closure performance standards will be managed under post-closure care requirements contained in 20.4.1 NMAC, Subpart V, Part 264, Subpart G. In the case of OB units that are co-located with other solid waste management units and that cannot meet the closure performance standards, closure will be accomplished by stabilizing, as necessary, the wastes and/or waste residues that remain in place and requesting NMED approval to address such units under alternative requirements, as allowed by 20.4.1 NMAC § 264.110(c), to meet post-closure care requirements.

F.3.4.3 Decontamination of Equipment

Prior to use, sampling personnel will ensure that all reusable and/or disposable sampling equipment to be used during decontamination in closure activities is clean. Sampling equipment rinsate blanks, if necessary, will be collected and analyzed in accordance with the QA/QC procedures described in the OB unit-specific closure SAP. Reusable decontamination equipment, including protective clothing and tools, used during closure activities will be scraped as necessary to remove any residue and cleaned with a wash water solution (the OB unit-specific closure SAP will include a discussion of wash water solutions). Residue and disposable equipment as well as reusable decontamination equipment that cannot be decontaminated will be containerized and managed appropriately at an approved on-site facility, depending on the hazardous waste constituents present.

F.3.5 Decontamination Verification

Sampling and analysis sufficient to demonstrate that hazardous waste residue is not present above the decontamination criteria levels at the OB unit after closure will be performed, as needed. Wash water or steam condensate sampling, swipe sampling for HE, or other appropriate sampling and analysis methodologies may be used to verify decontamination. The verification sampling method will be determined at the time of development of the TA-16 OB unit-specific closure SAP and will be based on factors such as COPCs and construction materials of the OB unit. The SAP will establish the minimum number of verification samples based on the overall sampling conditions of the OB unit. Using a biased random sampling approach, structures and/or equipment will be sampled for

verification of decontamination. Sample bias will include known or likely areas of contamination, low areas, and known spill locations, as determined on a case-by-case basis.

For wash water- or steam cleaning-based decontamination verifications (e.g., concrete pads and/or walls), samples of clean wash water solution squeezed from mops and/or sponges prior to use or from the steam cleaner will be collected as background before the initial wash down of any OB unit, as described in Section F.3.3.2 of this closure plan. The samples will be analyzed for the appropriate parameters, as presented in the closure SAP. Analytical procedures will conform to methods found in the most current version of *SW-846* (EPA, 1986) or other approved methods. Used wash down solutions will be analyzed for the same parameters. Structures and/or equipment will be considered contaminated if the used wash water solution shows a significant increase (i.e., determined using statistical methods defined in *SW-846*) in the analytical parameters over those in the clean wash water solution or does not meet other decontamination criteria in Section F.3.6. If subsequent wash downs are deemed necessary, an additional sample of clean wash water solution squeezed from mops and/or sponges prior to use or from the steam cleaner will be taken for each additional wash down event.

Swipe sampling and/or visual examination for HE may be used on a case-by-case basis to determine verification of decontamination at the TA-16 OB units. HE swipe samples will be analyzed using approved methods, which will be included in the closure SAP. The rationale for when the appropriate verification methods will be conducted will also be included in the SAP.

If other sampling methodologies have been developed at the time of closure for the TA-16 OB units, their use to determine decontamination will be addressed in the closure SAP.

For any sampling methodology, decontamination will be verified if the collected samples meet any of the decontamination criteria listed in Section F.3.6 of this closure plan. If the verification sampling indicates contamination higher than the approved values, additional sampling will be performed to establish the boundaries of contamination. After establishing the boundaries of contamination, the decontamination process will be repeated within those boundaries, using portable berms or other appropriate material to limit the potential for run-off from the affected area. An additional round of verification sampling will be performed for all of the areas previously determined to be contaminated. After each decontamination event and verification iteration, a

decision will be made to repeat the process or remove contaminated materials and dispose of them properly.

F.3.6 Decontamination Criteria

Successful decontamination is defined as one of the following criteria:

- No detectable hazardous waste or hazardous waste constituents from treatment activities are found in the final samples.
- Detectable hazardous waste or hazardous waste constituents from treatment activities in the final samples are at or below existing regulatory action levels, as agreed upon with the NMED.
- Detectable hazardous waste or hazardous waste constituents from treatment activities in the final samples identify no statistically significant levels based on baseline concentrations in the clean wash water.
- Detectable hazardous waste or hazardous waste constituents from treatment activities in the final samples are at or below levels agreed upon with the NMED.
- Detectable hazardous waste or hazardous waste constituent concentrations from treatment activities do not significantly decrease after several wash downs. In such an event, hazardous waste constituents that pose an acceptable risk will be allowed to remain, as mutually agreed upon with the NMED.

An alternative demonstration of decontamination may be proposed and justified at the time of unit closure, as circumstances indicate. The Secretary of the NMED will evaluate the proposed alternative in accordance with the standards and guidance then in effect and, if approved, incorporate the alternative into this closure plan.

F.4 SAMPLING AND ANALYSIS PLAN

Sampling and analytical procedures will be performed, as necessary, during the decontamination and verification activities associated with the closure of the TA-16 OB units covered by this plan. These procedures will use standard approved methods (e.g., *SW-846*, ASTM), as appropriate, for making closure decontamination verification determinations. However, the TA-16 OB units may not undergo closure for a relatively long time, and it is probable that sampling and analytical methods will be revised and improved before closure. In order to alleviate the need for future closure plan and permit modifications until actual closure activities are scheduled, LANL will submit TA-16 OB unit-specific closure SAPs to the NMED 90 days prior to the time of closure for NMED review and approval.

The TA-16 OB unit-specific closure SAPs will contain a detailed discussion of the available OB unit information and proposed closure methodology to assure that the closure performance standards are met. The closure SAPs for the TA-16 OB units will include:

- A detailed discussion of site characteristics.
- The OB unit operational history, to include descriptions of known spills, releases, and/or evidence of potential problems (e.g., visual stains, dead vegetation, solid waste management units).
- Chemical properties of the waste treated at the OB unit.
- Determination of applicable COPCs.
- A hazard control plan, including a review of chemical hazards present at the site, control and monitoring methods and procedures, and required PPE.
- Determination of wash water solution composition, if necessary.
- Detailed procedures for decontamination methods for equipment, structures, and media.
- Discussion of background levels determined through sampling or use of published data and their relevance to the specific OB unit.
- Methods for sampling and analysis of contaminated media.
- Removal procedures for contaminated media, if necessary.
- Sampling methods for decontamination media and hazardous waste determination. The discussion should include the rationale for using wash water samples, HE swipe samples, soil samples, and/or other sampling methodology.
- Sampling methods for decontamination verification procedures. The discussion should include the statistical or judgmental basis for determining the number of verification samples needed and the constituents to be analyzed for.
- Sampling equipment decontamination and disposition procedures.
- Sample handling and documentation procedures.
- Analytical methods (including detection limits) and the rationale for their determination.
- Disposition of removed waste, decontamination media, or contaminated soils. This discussion should include an identification of proposed on- or off-site hazardous waste management facilities that may be used for final disposition and the types of wastes anticipated to be shipped.

- Decontamination criteria.
- Statistical basis for verification of decontamination, if applicable. The discussion should include information on determination of statistical increases in analytical parameters and numerical values for significant increases.
- Risk assessment procedures to be used, if necessary.
- Field and laboratory QA/QC procedures.
- Schedule of closure activities, including decontamination, sampling, analysis, potential removal of soils, and closure certification submittal.
- Identification of contact person or office.

F.5 REFERENCES

EPA, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA-*SW-846*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.

Table F-1

General Schedule for Closure Activities at the Technical Area 16 Open Burning Units

Activity	Maximum Time Required[a]
Submit OB unit-specific sampling and analysis plan (SAP)	-90 Days
Notify the New Mexico Environment Department (NMED)	-45 Days
Collect background samples (as specified in SAP)	-5 Days
Final receipt of waste	Day 0
Begin closure activities – final treatment of wastes	Day 5
Decontamination of structure(s) and/or equipment	Day 10
Perform verification sampling of the structures and/or equipment	Day 20
Evaluate analytical data	Day 50
Perform additional decontamination (if necessary)	Day 55
Perform additional sampling (if necessary)	Day 60
Evaluate analytical data	Day 75
Perform asphaltic concrete or concrete decontamination and sampling (if necessary)	Day 80
Evaluate analytical data (if necessary)	Day 95
Perform soil sampling (if necessary)	Day 100
Evaluate analytical data	Day 120
Perform final cleanup (e.g., removal of decontaminated equipment and decontamination wastes)	Day 140
Verify decontamination	Day 150
Submit closure certification to NMED	Day 180

[a] The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously, may not require the maximum time listed, or may require more time than indicated above. Extensions to the schedule may be requested, as necessary.